

What is claimed is.

1. A multi-mode wireless device on a single substrate, comprising
an analog portion integrated on the substrate, including
a radio frequency (RF) front-end adapted to receive an RF signal from an
antenna; and
an analog to digital converter (ADC) coupled to the RF front-end to
digitize the RF signal; and
a digital portion integrated on the substrate, including:
a reconfigurable logic core coupled to the ADC, the reconfigurable
logic core adapted to handle a plurality of wireless communication
protocols;
one or more general purpose processor cores coupled to the
reconfigurable logic core; and
a high-density memory array core coupled to the reconfigurable
multi-processor core.
2. The wireless device on a single substrate of claim 1, wherein the protocol conforms to one of a Global System for Mobile Communications (GSM) protocol, a General Packet Radio Service (GPRS) protocol, an Enhance Data Rates for GSM Evolution (Edge) protocol and an 802.11A protocol.
3. The wireless device on a single substrate of claim 1, wherein the reconfigurable logic core delivers data in parallel to all general-purpose processor cores.
4. The wireless device on a single substrate of claim 1, wherein the reconfigurable logic core delivers data in series to the general-purpose processor cores.

5. The wireless device on a single substrate of claim 1, further comprising a first-in-first-out (FIFO) positioned between the reconfigurable logic core and each general-purpose processor core

6. The wireless device on a single substrate of claim 1, wherein the general-purpose processor core includes a multiply-accumulate (MAC) unit.

7. The wireless device on a single substrate of claim 1, wherein the general-purpose processor core comprises a reduced instruction set computer (RISC) processor.

10 8. The wireless device on a single substrate of claim 1, further comprising a router coupled to the processor, the cellular radio core, and the short-range wireless transceiver core.

9. The wireless device on a single substrate of claim 8, wherein the router further comprises an engine that tracks the destinations of packets and send them in parallel through a plurality of separate pathways.

10. The wireless device on a single substrate of claim 8, wherein the router sends packets in parallel through a primary and a secondary communication channel.

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11. A portable computer system, comprising:
a processor,

an input recognizer embodied in said program storage device, said input recognizer adapted to receive input from said user;

a multi-mode wireless device on a single substrate coupled to the processor, the device comprising:

5 an analog portion integrated on the substrate, including:

a cellular radio core having an analog to digital converter (ADC) adapted to receive a radio signal from an antenna, and
a short-range wireless transceiver core; and

a digital portion integrated on the substrate, including:

10 a reconfigurable logic core coupled to the ADC, the reconfigurable logic core adapted to handle a plurality of wireless communication protocols;

one or more general purpose processor cores coupled to the reconfigurable logic core; and

15 a high-density memory array core coupled to the reconfigurable multi-processor core;

a program storage device coupled to said processor; and

a computer readable code embodied in said program storage device and coupled to said input recognizer for receiving said user input.

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12. The portable computer system of claim 11, wherein the protocol conforms to a Bluetooth™ protocol.

13. The portable computer system of claim 11, wherein the protocol software conforms to a Global System for Mobile Communications (GSM) protocol.

14 The portable computer system of claim 11, wherein the protocol software
5 conforms to a General Packet Radio Service (GPRS) protocol.

15. The portable computer system of claim 11, wherein the protocol software conforms to an Enhance Data Rates for GSM Evolution (Edge) protocol.

10 16 The portable computer system of claim 11, wherein the reconfigurable processor core includes one or more digital signal processors (DSPs).

17. The portable computer system of claim 11, wherein the reconfigurable processor core includes one or more reduced instruction set computer (RISC) processors.

15 18. The portable computer system of claim 11, further comprising a router coupled to the processor, the cellular radio core, and the short-range wireless transceiver core.

20 19. The portable computer system of claim 18, wherein the router de-correlates data.

20. The portable computer system of claim 18, wherein the router decorrelates data into parallel streams that are not time-correlated